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AFRICAN BEES OF THE GENUS *ALLODAPULA*

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In 1926 Dr. H. Brauns published a very important paper on *Allodape* (Annals South African Museum, XXIII) in which he described the early stages and commented on the vast number of species inhabiting Africa. Unfortunately he published only a small part of what he knew, and many of his new species, named in manuscript, were published either by short comparative remarks or with regular descriptions by Strand and Friese. It has been customary to credit these to Brauns, and if this is not done, it becomes a difficult matter to decide between earlier brief allusions and later descriptions. In Ann. Mag. Nat. Hist., Aug. 1934, p. 220, I proposed a subgenus or genus *Allodapula*, with *A. variegata* (Smith) as the type. This group not only differs considerably in appearance from true *Allodape*, but the larvae and mode of life are different, as Brauns explained. I now propose to regard *Allodapula* as a genus. It has been stated that the simple hind trochanters of the males distinguish *Allodapula* from *Allodape*. This is generally true, but they are dentate in *A. rufipennis*, which is certainly a good *Allodapula*. *Allodapula* has lateral fleshy protuberances in the larva, quite wanting in *Allodape*. Brauns figures an *Allodape* larva with a dorsal protuberance, but this is not a true generic character, as it occurs also in *Allodapula strandi* (Masi).

In my studies of African *Allodapula*, I had set aside a great series of small species with black abdomen. They look superficially very much alike, but in now dealing with them, I have been able to separate numerous species.

The holotypes of the new forms will all be found in The American Museum of Natural History. All were collected by the Cockerell–Mackie–Ogilvie Expedition of 1931–1932.

Allodapula acutigera, new species

FEMALE.—Length, 7 mm.; black, including labrum, mandibles, antennae (flagellum faintly brownish beneath) and legs, except that small joints of tarsi are red; the hind tarsi have red hair, and that on the hind tibiae is reddish; clypeal mark deep yellow, anchor-like, upper margin concave, lateral descending lobes obtuse, stem narrowing to a point, not nearly reaching apex of clypeus; surface of clypeus dullish

and minutely punctured; tubercles yellow; mesothorax and scutellum polished; area of metathorax dull, with a raised shining margin; hair at sides of thorax dull white; tegulae black; wings hyaline, slightly brownish; stigma large, pale reddish with a dusky margin; nervures brown, first recurrent received far from base of second cubital cell, second nearer apex; abdomen broad, margins of tergites not discolored; tergites 4 to 6 conspicuously roughened; venter with hardly any hair.

Cape Province: Huguenot, Feb. 5–10, 1932 (J. Ogilvie). The clypeal mark is like that of *A. nigrinervis* Cameron and *A. lacteipennis* Brauns. The stigma in *A. nigrinervis* is dark brown; *A. lacteipennis* is a small species with perfectly clear wings. *A. nigrinervis* is very much like *A. gracilis* Bingham.

Allodapula albipennis (Friese)

Cape Province: Graaff Reinet, Oct. 1931 (J. Ogilvie). Two females, length, 4.8 to 5.3 mm. These agree with Friese's description, except that the mandibles are black. The flagellum is ferruginous beneath; the scutellum, while shining, is finely punctured, not polished like the mesothorax. The first recurrent nervure is near the base of second cubital cell, and the second quite at apical corner. The clypeal mark is a slender band, joined at each end to an equally slender transverse bar; this agrees well with Friese's description, though in a specimen from Grootfontein in the American Museum the vertical stripe is incomplete, the lower half represented only by a spot, and the apical transverse band is lacking.

Allodapula albomaculata, new species

MALE.—Length, about 4.5 mm.; black, shining, the mesothorax polished, scutellum dull, but showing a shining transverse band when seen from in front; clypeus entirely creamy white, not sulcate, with the usual lateral notches in the white, and small lateral bands next to clypeus, separated from it above the notch by a black line; labrum and large spot on mandibles white; antennae black, with scape white in front; tubercles yellowish white; tegulae hyaline; wings clear hyaline; stigma large, dark brown; nervures pale brown; second cubital cell receiving recurrent nervures near base and apex; basitarsi white, small joints pale red; first tergite shining apically, with a pair of crescentic depressions; the abdomen appears shining under a lens, but dull under a binocular.

Southern Rhodesia: Matopo Hills, April 17–30, 1932 (Alice Mackie). Allied to *A. maurula* (Cockerell) but easily distinguished by the little lateral marks on face, and the much shorter shining dorsal part of first tergite.

Allodapula angolensis (Cockerell)

Belgian Congo: Tshibinda, Aug. 21–27, 1931 (A. Mackie). Female,

differing from the type by having the second cubital cell much shorter on marginal.

Allodapula antiquorum, new species

FEMALE.—Length about 4.3 mm.; black, shining, the abdomen shining to the end; labrum and mandibles black; tubercles with a narrow light edge; clypeal mark broad at upper end, the upper margin convex, the sides narrowing from the top, converging to a point at lower end of clypeus, the whole mark having the shape of a much elongated kite; clypeus long, produced; mesothorax polished, scutellum finely punctured and dullish; area of metathorax dull, with a shining rim; tegulae pallid, dark at base; wings strongly reddened; stigma dark brown, nervures pale; first recurrent nervure meeting intercubitus a little on outer side, second some distance from end of second cubital cell; legs black; tubercles on first tergite large, shining; tergites without pallid margins.

Southern Rhodesia: Zimbabwe, Sept. 29, 1931 (J. Ogilvie). This is very much smaller than the red-winged *A. rufipennis* from Tshibinda. The red wings and clypeal mark distinguish it from *A. bukaviella* and *A. microsoma.*

Allodapula bevisi vagans, new subspecies

FEMALE.—Length, 4 mm.; agrees with *A. bevisi* (Cockerell) from Natal, in most particulars, but while the front and middle tibiae are bright chestnut red, the hind tibiae are black, red at base and apex. The creamy white clypeus has a black spot on each lateral margin, and a small gray band extends upward from the spot, about halfway up the broad upper portion of the light area. Labrum pale, but mandibles mainly black, reddish in middle; scape with a creamy white stripe, flagellum black; tubercles light; wings clear hyaline, iridescent, with large pale reddish stigma; nervures very pale, first recurrent joining second cubital cell very near base; mesothorax polished, scutellum dull; apex of first tergite with depressions (key-mark).

Belgian Congo: South of Bukavu, Aug. 28, 1931 (L. Ogilvie). I should imagine this to be an individual variation, except for the remote locality. It is easily known from *A. matopina* Cockerell by the black femora.

Allodapula brunneiventris, new species

FEMALE.—Length about 7.2 mm., anterior wing 4.5; black, with the abdomen dark reddish brown, the tergites blacker basally, and with slender pallid margins; clypeal mark yellow, straight above, where it takes the whole width of clypeus, but somewhat above the middle abruptly narrowed to a thick parallel-sided stem; labrum and mandibles black (antennae missing in type); tubercles pale yellow; thorax posteriorly and at sides with dull white hair; tegulae hyaline; base of wings conspicuously light yellow; wings hyaline, beautifully iridescent; stigma large, dark red; nervures light ferruginous; second cubital cell short and high, receiving first recurrent nervure near base, and second not so near apex; mesothorax highly polished, with no median sulcus; scutellum dull; area of metathorax rather short, dull, with a

shining margin; legs black, with the small joints of tarsi red, and middle and hind basitarsi rufescent; hair of hind tibiae and basitarsi silvery white; first tergite with a deep trilobed excavation, the margin posterior to it very narrow, with a pair of small swellings; sternites with outstanding white hair.

Portuguese East Africa: Mozambique, June 6, 1932 (J. Ogilvie). By the clypeal mark, this may be placed near *A. taita* Strand, but it is larger, and the abdomen is quite different. The color of the abdomen suggests the much smaller *A. brunnescens* Cockerell, from South Africa.

Allodapula bukaviella, new species

FEMALE (type).—Length, 4.5–5 mm.; shining black, the mesothorax highly polished, scutellum dull, area of metathorax with a shining rim; clypeal mark cream-color or nearly white, varying to a decided yellow, the upper part occupying the whole width of clypeus, the lower part (a little longer than upper part) a broad parallel-sided stem; labrum, mandibles and antennae black; tubercles light yellow; tegulae pale testaceous; wings appreciably dusky, especially apically; stigma dark brown with a pallid streak; nervures brown; first recurrent nervure meeting first intercubitus, second some distance before end of second cubital cell; legs black, including tarsi, which are slightly reddish at extreme end; abdomen broad, shining, the first tergite with weak apical depressions. Many specimens have the clypeal mark reddened by cyanide.

MALE.—Length about 4.3 mm.; clypeus pale yellow or distinctly lemon yellow, with the usual notch on each side, but no little lateral marks; labrum light, but mandibles and antennae black; tubercles pale; tegulae dark brown; tarsi black, or middle and hind ones obscurely reddish.

Belgian Congo: Type from Bukavu, August (L. Ogilvie). Many of each sex from Bukavu (J. Ogilvie, L. Ogilvie, A. Mackie, W. P. Cockerell, Cockerell), south of Bukavu (L. Ogilvie, J. Ogilvie) and Uvira (J. Ogilvie). This is larger than *A. minutula* (Friese), which is said to be little shining. The male is very like the South African *A. elizabethana* (Brauns), but is smaller, with light spot on tubercles. The female has the clypeal mark quite different from that of *A. elizabethana.* A male was taken by Miss Mackie at flowers of wild asparagus, south of Bukavu.

The following description of a species from Tshibinda was written under the impression that it could be separated, but close comparisons convince me that it is conspecific, and as the two specimens differ, there is at present no good basis for the diagnosis of a subspecies. The Tshibinda form, from a much higher altitude, might be expected to show racial differences.

FEMALE.—Length about 4.5 mm., anterior wing nearly 4; black, including labrum, mandibles and antennae, but tubercles mainly yellow; clypeal mark pale yellow, shaped like a goblet with a broad stem, which is very slightly expanded at the lower end; the junction of the broad upper part with the stem forms an

obtuse angle; the clypeus is flattened, shining, though not polished; mesothorax shining, scutellum entirely dull, area of metathorax dull; under the microscope, the mesothorax is seen to have excessively fine and dense transverse striae, and a very delicate median impressed line on anterior half; tegulae dark brown; wings dilute reddish; stigma dark brown, nervures brown; first recurrent nervure meeting intercubitus, the second some distance from end of second cubital cell; second cubital cell broad above, a little broader than first on marginal; legs black, scopa of hind legs white; margins of tergites not discolored; first tergite with two little swellings near hind margin.

Belgian Congo: Tshibinda, Aug. 26, 1931 (J. Ogilvie). A second specimen, taken at the same place on the same day (L. Ogilvie) has pale grayish wings; I think it is only a variety. It has the first recurrent meeting the intercubitus, as in the type.

This species is very close to *A. pembana* Strand, taken by Voeltzkow on Pemba Island, off the east coast of Africa. It differs only in small details, such as the shining clypeus, and wholly black labrum and mandibles.

I also find that I cannot separate the following females from *A. bukaviella*, though it is possible that when the males are associated with them, some differences may appear.

Katanga: Biano, three (A. Mackie, J. Ogilvie); Tenke, two (Cockerell); Elisabethville, one (Cockerell); Sakania, one (J. Ogilvie).

Tanganika Moero: Niunzu, one (J. Ogilvie); Albertville, two (J. Ogilvie).

Tanganyika Territory: Kigoma, two (J. Ogilvie).

Southern Rhodesia: Matopo Hills, three (J. Ogilvie, A. Mackie).

Transvaal: Wonderboom, near Pretoria, one (L. Ogilvie). In the South African fauna this would fall near *A. maurula*, but it is a smaller species.

Allodapula bulbifera, new species

FEMALE.—Length about 5 mm.; black, parallel-sided; labrum and mandibles with large punctures, black, the mandibles red subapically; antennae black, the flagellum obscurely brownish beneath, with the sutures black; tubercles broadly margined with light yellow; clypeal mark light yellow, T-like, truncate above, the corners of the lateral arms with downwardly directed points, the stem greatly swollen and bulbous (in outline) above, rapidly narrowing below, slightly broadened at apical margin of clypeus; mesothorax highly polished; scutellum somewhat shining but not at all polished, area of metathorax moderately shining; tegulae brown; wings dusky; stigma large, dark reddish brown; first recurrent nervure meeting intercubitus, second some distance from end of second cubital cell; legs black; abdomen parallel-sided, shining throughout, first tergite with a conspicuous depression on each side of the middle.

Southern Rhodesia: Vumba, Umtali, May 23–26, 1932 (Alice

Mackie). Among related species, it is distinguished by the swollen upper part of stem of clypeal mark. The shape of the abdomen suggests *A. durbanensis*, but that is quite differently marked and sculptured.

Allodapula convexa, new species

FEMALE.—Length about 4.5 to 5 mm.; black, including labrum, mandibles and antennae, but tubercles with a yellow spot; clypeal mark anchor-like, with a rather thick stem, the upper margin strongly convex (rounded), the arms directed downward in hook-like fashion; mesothorax highly polished, scutellum shining but not polished; tegulae brown; wings strongly brownish; stigma dusky red; second cubital cell receiving first recurrent nervure near base, second more remote from apex; legs black; abdomen shining throughout; tubercles of first tergite well developed.

Belgian Congo: south of Bukavu, Aug. 28, 1931, two (J. Ogilvie). Among the similar females it is readily known by the anchor-like clypeal mark, strongly rounded above. The shape of the clypeal mark at once separates it from *A. rufipennis*.

Allodapula debilitata, new species

FEMALE.—Length about 4.5 mm.; robust, black, including labrum, mandibles, scape and tubercles; flagellum faintly brownish beneath; clypeus long, shining, the pale mark creamy white, T-like, with very slender stem and transverse bar (the upper edge of which is very slightly concave), in one specimen the stem broken, the lower end represented by a small spot; mesothorax highly polished; scutellum dullish, shining anteriorly; area of metathorax moderately shining, with a dull central depression; tegulae pallid, translucent; wings clear hyaline, somewhat milky; stigma large, dark brown, with a paler streak; nervures brown; second cubital cell receiving recurrent nervures not far from base and apex; legs black, with white hair, the tarsi rufescent apically; abdomen with first three tergites shining, the others dull, with shining margins; first tergite without evident tubercles.

Southern Rhodesia: Matopo Hills, April, three (A. Mackie, J. Ogilvie). Among related females, it is known by the very slender facemarks, rather milky wings and black tubercles. It is near to *A. albipennis* Friese, but differs by the slender and quite differently colored stigma, black tubercles, etc.

Allodapula diloloensis (Cockerell)

Belgian Congo: Kabalo, Aug. 15 (J. Ogilvie); Biano, Aug. 8–11 (L. Ogilvie). Females, with the clypeal mark a little different from that of the type, but not to be separated.

Allodapula durbanensis, new species

FEMALE.—Length about 5.4 mm.; robust, parallel-sided; black, including mandibles and scape, but labrum pallid, and tubercles with a pale margin, flagellum obscurely reddish beneath; clypeal mark creamy white, T-like, with a long slender

stem, and a short rather thick transverse bar; mesothorax highly polished; scutellum large, entirely dull; area of metathorax dull; tegulae brown, with pallid margin; wings clear hyaline but not milky; stigma dusky reddish, the margin darker; nervures brown; second cubital cell very broad above, receiving recurrent nervures near base and apex; legs black, the tarsi rufescent at end; abdomen thick, parallel-sided, tubercles of first tergite distinct. The posterior part of mesothorax, beyond the obtuse transverse ridge, is finely lineolate, and shows a series of large round shallow pits; the scutellum also has such pits, mostly on the anterior part; the area of metathorax is not defined, it is finely transversely lineolate, with an irregular surface, and scattered pits.

Natal: Durban, October 1931 (J. Ogilvie). In a key to similar species, it runs next to *A. rufitarsis*, but it is larger, with darker stigma, and especially distinguished by the sculpture of the thorax.

Allodapula flavibasis, new species

FEMALE.—Length about 6 mm.; black, including mandibles, labrum and antennae, but tubercles apically yellowish white; clypeus black, except the upper end, which has a transverse yellow band, broad at sides, but on its lower margin with a pair of rounded incisions (invasions of the black surface), so that the band may be said to be trilobed below; clypeus long, flat, shining; mesothorax polished; scutellum large, dull; area of metathorax dull; thorax posteriorly and at sides with dull white hair; tegulae dark brown; wings brownish hyaline; stigma uniform dusky reddish; nervures pale reddish; second cubital cell not so long on marginal as first; recurrent nervures joining second cubital cell about equally distant from base and apex; legs black, with small joints of tarsi red; hind tibiae with copious silvery white hair; abdomen broad, the first three tergites shining, the margins of tergites narrowly brownish; first tergite with a pair of prominent bosses near hind margin.

Belgian Congo: Niunzu, Sept. 2 (J. Ogilvie). By the clypeal mark this resembles *A. lacteipennis* Brauns (the form called *basizona* Friese), but it is much larger and more robust, with differently colored wings.

What I suppose to be the male of this is represented by a specimen with the same data. The clypeus is yellow (reddened by cyanide), the yellow with a deep constriction on each side below the middle, but no little lateral marks; the upper side of the mark is gently concave; labrum with a large light spot, but mandibles black, rufescent subapically; scape yellow in front; flagellum dusky reddish beneath; tubercles with a yellow crescent; tarsi clear ferruginous. Length about 6 mm. This agrees in large part with the description of male *A. taita* Strand, but that has little yellow marks at each side of clypeus, after the manner of *A. albomaculata*, *A. melanosoma* and *A. rufitarsis*. The female is not like *A. taita*.

Another male *A. flavibasis*, with conspicuously reddish wings, comes

from Elisabethville, September (J. Ogilvie). It is easily known from *A. rufipennis* by the light tarsi and light stripe on scape.

Allodapula flavolateralis, new species

MALE.—Length about 4.3 mm.; black, head very large and broad, with very large eyes; clypeus pale lemon yellow, the light area very broad above, the upper margin gently concave, the sides gently rounded; the median constriction, rather below the middle, is deep, and there are no adjacent lateral marks; the lower part is very broad, like a reversed shallow cup, the lateral margins appearing elevated; under the microscope it is seen that the sides of lower part of clypeus are actually bordered by narrow lateral marks, which have the effect of broadening the lower part of clypeal mark (the type male of *A. maurula* also has such appended marks, but not so well developed, and only evident under a high power of the microscope); mandibles black, a little rufescent apically (they are yellowish white in *A. grandiceps* Friese); labrum yellow; scape yellow in front; flagellum entirely dark; mesothorax and scutellum polished, but the latter a little roughened; tubercles yellow; mesopleura shining but well punctured; tegulae hyaline, with a yellow spot; wings dusky, stigma rather dark brown, nervures dark brown; second cubital cell rather narrow above, receiving first recurrent nervure a considerable distance from base, and the second somewhat nearer apex; legs black, with pallid, somewhat reddish, tarsi; abdomen ordinary, very stout, appearing faintly brownish in contrast with the polished black of the thorax; first tergite with the usual submarginal tubercles.

Cape Province: Uitenhage, Oct. 1931 (A. Mackie). Related to *A. maurula* Cockerell, but certainly distinct by the lemon-yellow clypeal mark, the upper part of which is much broader, and the lack of light spots on the mandibles. The large head and general appearance seem to make it unlikely that it is the male of *A. luckhoffi.*

Allodapula foveata (Smith)

I examined Smith's type (from Sierra Leone) in the British Museum. It is about 7 mm. long; clypeus with a broad band, hard to see, as the specimen seems to have been in alcohol; hind tibiae and tarsi with long dull white hair; antennae black; tergites narrowly reddish margined; first tergite with a deep quadrate basal depression. Friese recorded it from Kilimanjaro, but I have a female of this lot, and it is a different species.

Allodapula gorillarum, new species

MALE.—Length about 4.3 mm.; black, including labrum, mandibles and antennae, but tubercles with a slender yellowish-white crescent; clypeus with a broad yellowish-white longitudinal band, constricted at sides well below the middle, the part below the constriction broadened, its lower end truncate; the upper part of the band widens slightly to the truncate upper end, but the whole effect is that of a broad band, the details described being only noticeable on close inspection; mesothorax

and scutellum shining, area of metathorax dull; tegulae very dark brown; wings brownish hyaline; stigma dark brown, nervures brown; first recurrent nervure meeting intercubitus (as in *A. progonia* Strand), the second joining second cubital cell a little before the end; second cubital cell very broad above; legs black; abdomen ordinary, two tubercles near hind margin of first tergite.

Belgian Congo: near Tshibinda, Aug. 24, 1931 (J. Ogilvie). This was taken on the excursion with the pygmies to the haunts of the gorilla, and came from an altitude higher than Tshibinda. In the tables it runs near the female of *A. elizabethana* Brauns, which has a much more slender clypeal band, but it is very unusual for a male to have a median band.

Allodapula hamatifera, new species

FEMALE (type).—Length about 6.5 mm., anterior wing 4.5; black, including labrum, mandibles, antennae and tubercles; clypeus with a creamy white (turned pale brownish by cyanide) T-like mark, the upper margin straight, the transverse upper part a rather narrow band, produced and hook-like at the posterior lateral corners; the stem long (the clypeus being quite long), slender, usually with a distinct swelling in its upper part; frontal keel very strong; hair of thorax dull white; mesothorax polished, scutellum entirely dull; area of metathorax shorter than usual, dull, with a shining margin; tegulae very dark, slightly brownish; wings dusky hyaline; stigma dusky brownish with a darker margin; marginal cell on first cubital cell at least as broad as on second; second cubital cell receiving recurrent nervures near base and apex; tarsi somewhat reddish at tips; hair of legs white (collecting bright orange pollen); abdomen broad, margins of tergites very narrowly, inconspicuously, pallid; first tergite near apical margin with a pair of elevations; sternites 2 to 4 with very bright white hair, but on apical part of venter it is pale grayish.

MALE.—Length about 5 mm.; mandibles, antennae and tubercles black; labrum with a very small light spot; clypeal mark joined to a broad transverse apical band; legs dark as in female.

Southern Rhodesia: type from Vumba, Umtali (J. Ogilvie). Fifteen females and one male from Vumba and Christmas Pass, Umtali, May (J. Ogilvie, L. Ogilvie, A. Mackie).

The female may be compared with related species thus:

1.—Broad part of clypeal mark quadrate, not greatly shorter than stem. . *taita* Strand.
Broad part of clypeal mark a transverse band, much shorter (anteroposteriorly) than stem. . . . . 2.
2.—Stem broad, its upper part expanded, and more than half as wide as clypeus. *diloloensis* Cockerell.
Stem narrow, less than half as wide as clypeus. . . . . *hamatifera* Cockerell.

From all the above, *A. elizabethana* Brauns is distinguished by being smaller, the clypeus with a longitudinal pale line. The female of *A. hamatifera* must also be very similar to *A. T-insignita* Strand, but not the same.

The male *A. hamatifera* is close to *A. angolensis* Cockerell, differing

by being smaller, with a much smaller spot on labrum, clypeal mark with apical band meeting stem at a right angle, and second cubital cell not nearly so broad above. The male also appears to be allied to *A. rolini* Vachal.

From Tanganyika Territory: Kigoma, August (J. Ogilvie), and Ujiji (Cockerell, A. Mackie, J. Ogilvie) come numerous females of *A. hamatifera*, differing slightly in that the upper part of the stem of the clypeal mark shows no swelling.

One female, having the second recurrent nervure much more remote from end of second cubital cell than usual, is from Kabalo, Belgian Congo, August 15 (J. Ogilvie). A male is from Niunzu, Belgian Congo (120 kilom. east of Kabalo), September 2 (J. Ogilvie). In Katanga, three females were taken at Tenke, July–August (L. Ogilvie, J. Ogilvie), one at Biano, August (A. Mackie), four at Sakania, September (A. Mackie, J. Ogilvie), and nine at Elisabethville, September (L. Ogilvie, J. Ogilvie, Cockerell). These Katanga specimens are somewhat variable; four from Elisabethville and one from Sakania have the tubercles narrowly edged with yellowish white. In a species with such a wide range, local races are to be expected, but I cannot clearly define any at present.

The following females, referred here, are not typical:

(1) Smaller, about 6 mm. long, wings dusky hyaline. Matopo Hills, Southern Rhodesia, five (C. P. Harvey, A. Mackie).

(2) Smaller, about 5.5 mm. long, wings darker, decidedly brownish. Kafubu Mission, Katanga, two (L. Ogilvie).

Allodapula innata, new species

FEMALE.—Length about 5.3 mm.; black, with all the tibiae and tarsi bright chestnut red (the front tibiae have a dusky stripe on outer side), the knees also narrowly red and a red stain on hind trochanters and base of femora in front; scape black, with a light spot at each end; flagellum obscurely brownish beneath toward apex; clypeal mark clear light yellow, having the outline of a goblet with a thick stem, the constriction oblique, not angular; labrum obscurely reddish; mandibles black; tubercles light yellow; tegulae dark brown, pallid posteriorly; wings clear hyaline; stigma large, sepia brown; nervures rather pale brown; second cubital cell receiving first recurrent nervure some distance from base, and second nearly as far from apex; mesothorax highly polished; scutellum dullish; first tergite with a broad median depression; hind margins of tergites not distinctly reddened; hair of hind tibiae silvery white.

Southern Rhodesia: Matopo Hills, April 17–30, 1932, three females (A. Mackie, L. Ogilvie). This is the type locality, but there is also one from Louis Trichardt, Transvaal, April 4–10 (A. Mackie). Two females

are from Umtali (Vumba and Christmas Pass), Southern Rhodesia, May (J. Ogilvie); one is from Shangani, De Beer's Ranch, May (J. Ogilvie); one from Victoria Falls, Sept. (L. Ogilvie). I have three males which I must refer to this species, as they seem to differ only in the usual sexual characters. The clypeus is all light except a notch on each side; the scape has an entire light band in front; the hind femora are obtusely subangular below. One of these is from the Matopo Hills (A. Mackie); the other two, with somewhat broader face, are from Lubumbashi, Katanga, July 22, 1920 (Michael Bequaert).

Related to *A. claripes* Friese, but distinguished by the polished mesothorax. *A. citrifloris* Cockerell is smaller, the clypeus yellowish white, scape light in front, a light spot on mandibles.

Allodapula kivuensis, new species

FEMALE.—Length about 6 mm., anterior wing nearly 5; black, including antennae, labrum and mandibles, but tubercles broadly margined with deep yellow; clypeal mark T-like, yellow (reddened by cyanide in type), the stem moderately broad, the upper (transverse) part short, and sloping to the stem; clypeus not at all grooved; mesothorax shining; scutellum dull, moderately shining but not polished on disc; area of metathorax somewhat shining; mesopleura dullish, with dense small punctures; tegulae dark brown; wings strongly brownish, stigma and nervures dark brown; legs black, hind legs with copious white hair; abdomen with first three tergites shining; first tergite with two longitudinal depressions; venter with pure white hair.

Belgian Congo: Lake Kivu, at Bukavu, Aug. 20, 1931 (T. D. A. Cockerell). Resembles *A. taita* Strand, but easily separated by the brownish wings, and the much shorter broad part of the clypeal mark. The wings suggest *A. rufipennis* from Tshibinda, but that has quite a different clypeal mark, and the tubercles are black.

Allodapula krugeri, new species

FEMALE.—Length about 4.3 mm.; black, the labrum obscurely brownish, mandibles red apically; scape black, flagellum obscurely brownish beneath; tubercles with a light margin; clypeal mark T-like, straight above, lateral arms short, with points directed downward, stem rather thick; mesothorax polished, with a deep circular fovea in the middle; scutellum moderately shining, but not polished, minutely granular, with scattered very small punctures; area of metathorax entirely dull; tegulae brown; wings dusky; stigma rather light red, nervures all very pale reddish; second cubital cell narrow above, receiving first recurrent nervure at basal corner, second some distance from end; legs black; abdomen broad, shining throughout.

Transvaal: Kruger National Park, Oct. 1931 (J. Ogilvie).

There are three kinds of minute females, which at first I regarded as one species, but they are readily separable thus:

1.—Nervures all pale, stigma pale reddish, mesothorax with a fovea in middle. *krugeri*, n. sp.
Nervures darker, mesothorax without a fovea.....2.
2.—Wings pale grayish; clypeal mark with a long rather slender stem..*rhodesi*, n. sp.
Wings reddish; clypeal mark with a shorter, broader stem.....*pusilla*, n. sp.

A. krugeri has the small size and light stigma of *A. microsoma*, but the clypeal mark is quite different.

Allodapula lacteipennis (Brauns)

Cape Province: Calvinia, two females, Nov. 11–16, 1931 (A. Mackie). One has a slender transverse white line at top of clypeus, and the tubercles with a slender white crescent; in the other the face and tubercles are entirely black. In a series of nine females from Blaukrans, near Calvinia (Cockerell, W. P. Cockerell, J. Ogilvie) the face is entirely black, and only two show traces of light color on tubercles. Friese describes the face of female *A. lacteipennis* as all black; my specimens from Brauns show the white band at the top of clypeus. The type locality is Willowmore.

Two females from Van Rhyn's Pass (L. Ogilvie, Cockerell) have the face all black. A female from Doorn River Falls, Nov. (Cockerell), has some very minute light marks at upper edge of clypeus.

Allodapula littoralis, new species

FEMALE.—Length about or nearly 6 mm.; black, with red legs and yellow tubercles. It closely resembles *A. pulchripes* Cockerell, but differs thus: clypeal mark clear light yellow, the sides of the broad stem (or lower half) bulging; mandibles red in middle; scape with a slender yellow line; scutellum entirely dull; stigma reddish brown; front trochanters largely black; front femora broadly black behind, and on basal half in front. The first recurrent nervure joins second cubital cell a considerable distance from base, but second almost at apex. The first tergite has a pair of longitudinal depressions.

Portuguese East Africa: Mozambique, June 6, 1932 (J. Ogilvie).

Allodapula luapulana, new species

MALE (type).—Length, 4–4.3 mm.; black, shining, but the apical tergites dullish, with polished margins; mandibles with a very large subtriangular yellow spot; labrum with a large pale spot; antennae black, the flagellum very faintly brownish beneath; clypeal mark lemon yellow, consisting of an upper subquadrate broad part, its upper margin straight, its sides gently convex, with tooth-like downward projections, but these contiguous with the rest of the mark; in the middle the mark is deeply constricted to about half the diameter of the upper part, narrowest where it joins the lower (apical) part at a very acute angle, the apical part being a very broad transverse band; thorax at sides and posteriorly with much dull white hair; tubercles with a yellow margin (all black in a second specimen); mesothorax highly

polished; scutellum shining but punctured, polished in middle of disc; area of metathorax dull; tegulae very dark brown; wings conspicuously brownish; stigma dark reddish brown, nervures brown; second cubital cell receiving first recurrent nervure very near base, second not so near apex; legs black, with small joints of tarsi red; first tergite with small tubercles.

FEMALE.—Length about 4.3 mm.; labrum and mandibles black; tubercles with a narrow light edge, or all black; clypeal mark like a T with a very long narrow parallel-sided stem, the transverse bar also narrow, a little arched above, descending and more or less hooked at ends; scutellum duller, not polished in middle; wings conspicuously brownish.

Belgian Congo (Katanga): Tenke, July–August, two of each sex (Cockerell, A. Mackie, L. Ogilvie). The female is related to *A. antiquorum*, but the face-mark is quite different. The male suggests *A. wilmattae*, but it is much smaller.

There is also a female *A. luapulana* from Biano, Aug. (A. Mackie). The tubercles are black. A female from Katanga Mission, Sept. 17 (J. Ogilvie) has the tubercles broadly yellow. One from Dilolo, July (W. P. Cockerell) has a yellow crescent on tubercles. It is rather large, over 5 mm. long.

Allodapula lucidula, new species

MALE.—Length about 4 mm., like *A. elizabethana* Brauns, but distinguished by the much paler stigma and white face-marks. I was almost ready to consider it the undescribed male of *A. longula* (Friese), but the tegulae are dark brown; in *longula* white with a brown spot. The labrum has a large pale spot, but the mandibles and antennae are black. The scape of *A. lacteipennis*, according to Friese, is white in front in the male, otherwise I might have thought *A. lucidula* the male of *lacteipennis* (agreeing in the clear wings and light stigma), of which I possess only the female. The clypeus is not all concave or grooved, as it is said to be in *A. pembana* Strand and *A. minuta* Friese. Other salient characters are: tubercles black; mesothorax and scutellum polished all over, and area of metathorax moderately shining; legs black, the basitarsi brownish, the small joints of tarsi light reddish; first recurrent nervure meeting intercubitus, second some distance from end of second cubital cell.

Cape Province: Van Rhyn's Pass, Nov. 11–21, 1931 (T. D. A. Cockerell).

Allodapula luckhoffi (Cockerell)

Cape Province: Uitenhage, four females (A. Mackie, L. Ogilvie).

Southern Rhodesia: Matopo Hills, two females, April 17–30 (A. Mackie). These have the head more elongated (clypeus more produced) than in the typical form.

This species is readily separated from numerous similar females by the polished scutellum and the concave upper margin of clypeal mark.

Allodapula luckhoffi microsoma, new subspecies

FEMALE.—Length, 4 mm.; black, shining; labrum light red; mandibles black; clypeus with an anchor-shaped very pale yellow mark. The upper margin concave, the narrow lateral arms (at upper end of clypeus) each with a hook-like point directed downward, the stem slender, rapidly narrowing to a line, its length variable; scape with a small light spot near base, flagellum pale dusky brown beneath; tubercles with a narrow light edge; mesothorax, scutellum and mesopleura polished; area of metathorax dullish, not at all polished; tegulae pale brown; wings clear hyaline, iridescent (but not appearing milky); stigma pale sepia throughout; nervures very pale brown; second cubital cell narrow above, receiving first recurrent nervure a considerable distance from base, the second nearer apex; legs black, dusky reddish at end, but the basitarsi dark; abdomen with the first three tergites shining, the apical tergites conspicuously hairy; first tergite broadly shining dorsally, without evident tubercles.

Cape Province: Graaff Reinet, Oct. 1931 (Alice Mackie, J. Ogilvie). This is a sort of small edition of *A. albipennis* Friese, from southwestern Africa, but that is not only larger but has the wings milky and the stigma very pale (specimen from Windhoek examined). It is also related to *A. lacteipennis vernayi* Cockerell, but much smaller, with darker stigma. The polished scutellum, and position of first recurrent nervure, distinguish it from certain species of Central and East Africa.

A. luckhoffi microsoma was also collected at Oudtshoorn, Oct. 1931 (T. D. A. Cockerell). I had separated this from *A. luckhoffi*, also found at Graaff Reinet, on account of its small size. It probably breeds in smaller stems, but I am now uncertain whether it is really a different species, or a result of poorer nutrition. Some authors argue that a species cannot have a subspecies in the same locality, but this may not apply to bees, which can be segregated by their different modes of life. I find that in many parts of Africa the local *Allodapula* can be segregated into larger and smaller forms or species, and it is not certain whether the small species are most related to one another, or to the larger species occurring in the same regions.

Allodapula matopina, new species

FEMALE.—Length, 4.6–5.3 mm.; black, mostly shining, but although the mesothorax is highly polished, the scutellum is dull; hair of thorax very scanty, white; clypeus yellow with the light mark constricted on each side, the outline like that of a goblet with a very broad saucer-like base; labrum red; mandibles red in middle; scape with a pale stripe; flagellum black, faintly brownish beneath apically; area of metathorax dull, with a shining rim; tubercles pale yellow; tegulae very small, testaceous; wings hyaline; stigma large, reddish with a darker margin; nervures rather light brown; second cubital cell short, receiving recurrent nervures about equally distant from, and quite near, base and apex; legs bright chestnut red, the coxae, and front trochanters in part, black; hair of hind legs shining silvery; ab-

domen broad, the basal half shining; first tergite with a pair of depressions, the key-like marking of Strand.

Southern Rhodesia: Matopo Hills, April 17–30, type locality, 20 females (J. Ogilvie, L. Ogilvie, A. Mackie).

Transvaal: Louis Trichardt, April 4–10, five females (A. Mackie, J. Ogilvie). An occasional specimen from each locality has the front femora so dark as to be practically black, and hence suggests a reference to *A. transvaalensis* Strand. But, so far as I can gather from Strand's brief account, his species is distinctly larger and lacks the key-like depression on first tergite. Strand had three specimens, from Three Sisters in the Barberton District.

The species is noteworthy for having the clypeal mark like that usual in males of this group. A specimen from Shangani, De Beer's Ranch, May 8–12 (L. Ogilvie), has lost the abdomen, but it is confidently referred to the same species. It has the dull scutellum. Four males from the Matopo Hills (A. Mackie, J. Ogilvie, L. Ogilvie) are referred here; they resemble the female, but the scutellum is distinctly shining, the clypeal mark occupies the whole surface, except a slender oblique incision on each side, and the labrum and mandibles are light. Thus the male approaches *A. claripes* Friese, from French Guinea and the Gold Coast, but this species has the thorax hardly shining.

I found in the British Museum a specimen marked *A. rolini* Vachal, variety, compared with type by Meade-Waldo. It has the legs clear red, wings very clear, stigma very large, clypeal mark very broad, scape light in front. There is no locality label, but it is marked Sharp coll., 1905-313. The original *A. rolini* came from Boma Sundi, and had only the knees and tarsi reddish, instead of entirely red legs. Undoubtedly it is a different species.

Allodapula maurula (Cockerell)

Natal: Merebank, one female (J. Ogilvie); four females, The Bluff, Durban (W. P. Cockerell); one female, Durban (J. Ogilvie).

Allodapula melanosoma, new species

MALE.—Length about 5 mm.; black, shining, the mesothorax polished, the scutellum dull; clypeus white, with the usual median constriction, and with small lateral marks, contiguous with clypeus at lower end, but otherwise separated by a rather broad band of black; labrum white, mandibles black; antennae black; tubercles black; tegulae brown; wings clear hyaline; stigma brown, the margin darker; nervures light brown; second cubital cell receiving recurrent nervures some distance from base and apex; legs black, with white hair, the tarsi pale reddish only at tips; abdomen shining, first tergite with a pair of transverse depressions.

Southern Rhodesia: Matopo Hills, April 17–30, 1932 (J. Ogilvie). Distinguished from *A. albomaculata* (Cockerell) by the black mandibles and scape, and character of first tergite.

Allodapula minuta (Friese)

This appears in Friese's 1924 table, p. 73, and we are told that it is very small, with dark legs, strongly grooved clypeus, clear wings and abdomen almost all black. It is referred on p. 70 to the group of *A. parvula*, but no locality is given. In The American Museum of Natural History I found a female from Durban, Natal, received from Friese. It ran in a couplet with *A. longula* (Friese), which is a distinct species, not a variety of *A. albipennis* Friese.

Wings milky white; stigma very pale; clypeus white, the light area broader (Windhoek) ..... *longula* (Friese), female.
Wings grayish; stigma not so pale; clypeal mark light yellowish, and narrower. *minuta* (Friese), female.

The clypeal mark of *A. minuta* is like that of *A. gracilis* (Bingham) which has a dark brown stigma. *A. gracilis* has the small joints of tarsi reddish yellow. I do not feel sure that *A. minuta* can be separated from *A. gracilis*.

Allodapula monticola (Cockerell)

A second female from Calvinia, Cape Province (J. Ogilvie), differs from the type by having a very large transverse (fusiform) yellow mark on scutellum, and the upper border of prothorax with much yellow.

Allodapula nativitatis, new species

FEMALE.—Length about 5.3 mm., anterior wing 4.2; black, rather robust, with scanty white hair; small joints of tarsi (as in the much smaller *A. gracilis* Bingham) red; labrum, mandibles, antennae and tubercles black; clypeus shining, not grooved or hollowed; clypeal mark dull yellow, occupying whole width of clypeus at top, but soon narrowing obliquely (not abruptly) to a moderately broad stem, which narrows apically, the whole outline like that of a flower with a tubular base; a strong swelling around front ocellus; mesothorax polished but scutellum dull; area of metathorax large, dull, with a somewhat shining margin; tegulae rather large, dark brown, pallid externally; wings ample, clear hyaline, beautifully iridescent; stigma large, dark brown, nervures brown; second cubital cell very broad above, receiving first recurrent nervure a short distance from base, and second a little nearer apex; hind legs with abundant white hair; abdomen broad, the apical part dull; first tergite shining, with a pair of swellings near apical border. The flagellum is very faintly brownish beneath. The upper edge of clypeal mark is straight.

Southern Rhodesia: Christmas Pass, Umtali, May 20–21, 1932 (J. Ogilvie). Very like *A. taita* Strand, as I have identified it, but that

has the broad part of clypeal mark quadrate, the tubercles yellow and the dorsal part of first tergite larger. Although they are very similar, I feel confident that they are distinct. It is larger than *A. innata*, the clypeal mark is a deeper yellow and the tubercles and tibiae are black. It is much larger than *A. maurula* with darker stigma.

Allodapula nigriceps (Friese)

FEMALE.—Length about 6 mm.; black, the face without light markings; clypeus shining, flattened, finely but very distinctly punctured all over; antennae black; tubercles black; mesothorax polished, but scutellum dull; tegulae hyaline; wings clear hyaline, with very pale nervures; stigma pale, with a heavy dark margin; second cubital cell receiving first recurrent nervure a short distance from base, the second very near apex; legs black, with white hair, tarsi rufescent at end; abdomen broad, the first three tergites shining; first tergite with a widely separated pair of bosses next to hind margin.

Southern Rhodesia: Matopo Hills, three females, one Oct. 1931 (J. Ogilvie) and two April 17–30, 1932 (L. Ogilvie, Alice Mackie). This species is very briefly cited, without locality, in Friese's 1924 table, but such information as is given agrees with the specimens before me.

Allodapula nigritula, new species

FEMALE.—Length about 4.5 mm.; black, without light markings; head transverse, with wide face; clypeus little produced, flattened, very minutely punctured, with a slender median smooth line; flagellum faintly brownish beneath; mesothorax and scutellum highly polished; area of metathorax shining; tegulae brown; wings clear hyaline, with very pale nervures, and pallid stigma with light brown margin; second cubital cell receiving recurrent nervures a moderate distance from base and apex; legs black, the tarsi reddish at tips; abdomen broad, first tergite with a broad deep excavation, but no apical bosses.

Cape Province: Calvinia, Nov. 1931, three (T. D. A. Cockerell). This may be distinguished from several other black-faced females thus:

1.—Scutellum with a yellow mark; front and middle tibiae bright red in front. *monticola* Cockerell.

Scutellum and tibiae black.....2.

2.—Larger; scutellum dull.....*nigriceps* Friese.

Smaller; scutellum polished.....3.

3.—Larger; first tergite with two swellings near apical margin. *lacteipennis* Brauns, variety.

Smaller; first tergite with no such swellings, but deeply excavated. *nigritula* Cockerell.

A characteristic feature of *A. nigritula* is the short broad head. A female of this species comes from Van Rhyn's Pass, November (A. Mackie).

Allodapula niunzua, new species

FEMALE (type).—Length about 4.3 mm.; black, with the tarsi, and tibiae at

base, clear red; clypeus mainly yellow (reddened by cyanide in types), the yellow area only a little narrowed on apical half, the upper edge of the yellow straight; labrum black or a little brownish, mandibles black; scape black, with a minute light spot near base; flagellum brown to black, but always light reddish apically beneath; tubercles yellow; tegulae hyaline; wings hyaline, stigma very pale reddish, with no dark margin; nervures very pale, second cubital cell very narrow above, receiving first recurrent nervure very near base, but bulging considerably beyond second recurrent; mesothorax polished, with a strong median groove; scutellum dullish, but somewhat shining; area of metathorax dull; first tergite with a pair of shining bosses near hind margin. Friese and Strand stress the concavity of the clypeus in certain species; in the present species it is sometimes distinctly concave, but this is not constant.

Belgian Congo (District du Tanganika Moero): Niunzu, four females, Sept. 2, 1931 (J. Ogilvie). There is also a single male, 3.3 mm. long, with the same data. It is like the female, but the labrum is yellow, and the clypeal mark is broad below, with a little constriction on each side below the middle. The scape has two light dots.

This minute species differs from *A. albitarsis* Friese by the red tarsi. *A. pembana* Strand is closely allied, but has dark basitarsi, and the first recurrent nervure meeting intercubitus. *A. perpusilla* Strand differs by the T-like mark on clypeus and the tarsi not red.

Allodapula paupercula, new species

MALE.—Length about 4 mm.; black, both mesothorax and scutellum shining, the mesothorax with a strong median groove; clypeus white, not sulcate, with strong lateral constrictions, but no adjacent lateral marks (in the cotype the clypeus is reddened by cyanide); labrum white; mandibles black; antennae black; tubercles black; tegulae dark with pale margin; wings clear hyaline; stigma pale with dark margin; nervures pale; second cubital cell receiving first recurrent nervure a short distance from base, second nearer apex; legs black, the tarsi only reddish at tips; abdomen short and broad, the first tergite with a transverse shining apical band.

Southern Rhodesia: Matopo Hills, April 17–30, 1932 (Alice Mackie). Differs from *A. rufitarsis* Cockerell by the dark tarsi, lack of lateral marks near clypeal incisions, and other characters.

Allodapula peratra, new species

FEMALE.—Length about 5.6 mm.; black, rather robust, the head broader than long; no light marks on head or thorax; sides of thorax with thin grayish hair; clypeus shining, finely punctured; flagellum brownish beneath; mesothorax, scutellum and postscutellum polished; area of metathorax dull, with a shining margin; mesopleura highly polished; tegulae brown; wings clear hyaline but hardly milky; stigma pale brown, the margin darker; nervures very pale; second cubital cell receiving first recurrent nervure far from base, the second near end; basal nervure almost meeting nervulus; legs black, the tarsi a little brownish at end; scopa of hind

tibiae white; abdomen broad, more or less shining throughout (the apical tergites shining), the first tergite highly polished; hair on venter extremely short.

Cape Province: Oudtshoorn, Oct. 1931 (J. Ogilvie). In my tables it runs next to *A. nigritula* Cockerell, but it is much larger, and evidently quite distinct. Compared with *A. lacteipennis* it is larger, with darker stigma and other characters. The dark tubercles and other characters separate it from *A. vitrea* Vachal, which occurs at Delagoa Bay. In *A. paradoxa* Brauns the first recurrent nervure meets the intercubitus, and the abdomen is different.

Allodapula poculifera, new species

FEMALE.—Length, 7.6–8.5 mm.; black, with lemon-yellow markings as follows: clypeal mark occupying the whole width above, and below a broad band, the outline that of a goblet with a very broad stem, the sides of the broad part below sloping, not presenting an angle; upper border of prothorax and the tubercles also yellow; coxae, trochanters and femora black; front tibiae light red, blackened posteriorly; middle tibiae rather broadly red at end; hind tibiae black; tarsi all red; labrum with a minute yellow dot; mandibles black; flagellum obscurely brown beneath; front with a strong raised Y, the middle ocellus between the arms; mesothorax and scutellum highly polished; area of metathorax very large, dull; hair of thorax dull white; tegulae black, a little reddish externally; wings hyaline, the basal half faintly brownish, stigma large, dusky reddish, nervures dark brown; second cubital cell long, receiving first recurrent nervure some distance from base, second nearly at apex; coarse hair on hind tibiae and tarsi pale, slightly reddish; abdomen ordinary, the basal half shining, the apex turned upward.

Cape Province: Huguenot, Feb. 5–10, 1932 (J. Ogilvie). At Ceres occurs a variety with the upper border of prothorax black, with very minute yellow marks, the tubercles dark and slightly reddish, the wings distinctly reddish. It was collected Nov. 1920, by R. E. Turner; but another, from Mitchell's Pass, Ceres, Feb. 9–17 (J. Ogilvie), has the tubercles broadly yellow, and the wings not distinctly reddish. I assume that these are individual variations.

On account of the largely red legs, this falls in the group of *A. bevisi* Cockerell, *A. rufipes* Friese, etc., but it is easily separated by the much greater size.

Allodapula pogonias (Strand)

Transvaal: Louis Trichardt, April 4–10, twenty-three females and one male (A. Mackie, J. Ogilvie, L. Ogilvie). The male is new. It differs from male *A. maurula* (Cockerell) by the lemon-yellow clypeal mark, which is strongly excavated or concave on upper margin, while the lower half, below the lateral incisions, is suboval, not broadened laterally; labrum yellow but mandibles black (in *maurula* the mandibles

have a large light spot); wings not at all dusky; tarsi dull but pale reddish. *A. pogonias* was based on two females from "Kapland," collected by Krebs. It is rather large for a member of the *A. parvula* group, and the special character, stressed by Strand, is the concave upper margin of the clypeal mark. This is usually very distinct, but a few specimens have the margin practically straight. There are also two, which I believe should not be separated, in which the clypeal mark is T-like, with a slender stem. These might be referable to *A. nigrinervis* (Cameron), which is certainly very closely allied.

A series of twenty-seven females from the Matopo Hills, Southern Rhodesia, April 17–30, 1932 (J. Ogilvie, L. Ogilvie, A. Mackie, C. P. Harvey) is referred here, although many of them have the upper margin of the clypeal mark practically straight, and could be placed with *A. maurula* on this character. Further difficulty arises from the fact that these females are accompanied by five different males, none of them identical with the *A. pogonias* male from Louis Trichardt, nor with the male of *A. maurula*. There is, however, a single male which is near enough to *A. pogonias* to be regarded as a variation. The whole series of males separates out thus:

1.—Light face-marks with oblique incisions laterally, the appearance due to the development of small lateral marks, not on the clypeus.....2.
No such small lateral marks on face.....4.
2.—Mandibles with a large white spot; scape yellowish white in front (Matopo Hills, one, A. Mackie).....*albomaculata*, n. sp.
Mandibles black.....3.
3.—Larger; tubercles entirely black; scape black; tarsi dark (Matopo Hills, one, J. Ogilvie).....*melanosoma*, n. sp.
Smaller; tubercles margined with white; tarsi pale red (Matopo Hills, one, A. Mackie).....*rufitarsis*, n. sp.
4.—Mandibles with a white spot; scape white in front (Natal)...*maurula* Cockerell.
Mandibles with no white spot.....5.
5.—Scape all black; face-marks white; tubercles black (Matopo Hills, two, A. Mackie).....*paupercula*, n. sp.
Scape with a light stripe; tubercles yellow.....6.
6.—Lower part of face-mark expanded, approaching orbits, but separated by a ridge which occupies the whole narrow space between face marks and orbits (Matopo Hills, one, A. Mackie).....*pogonias* Strand, variety.
Lower part of face-mark not approaching orbits, the strong ridge well separated from it (Louis Trichardt).....*pogonias* Strand.

A. facialis (Gerst.), as determined by Friese, from Kigonsera (near north end of Lake Nyasa), runs to *A. pogonias*, variety, differing by the white instead of light red basitarsi. *A. facialis* was based on the female,

from Mozambique, and judging from the description, I do not believe this male belongs with it. The mesothorax is highly polished.

A. albipes (Cockerell) has the lateral marks, but they are very small; the mandibles have a large white spot; scape all black, flagellum red beneath, tubercles light-margined. It is from Graaff Reinet.

A. elizabethana (Brauns) runs out at 5, having the face-mark orange.

There are seventeen female *A. pogonias* from Umtali (Vumba and Christmas Pass), Southern Rhodesia, May (J. Ogilvie, L. Ogilvie, A. Mackie). Three females from Zimbabwe, Sept. 30 (Cockerell, A. Mackie), and ten from Shangani (De Beer's Ranch), May (J. Ogilvie, L. Ogilvie, A. Mackie), form a group averaging distinctly smaller but otherwise not to be separated. Regarding all these females from different localities, I find it impossible to separate *A. pogonias* in this sex from *A. maurula*, but the males (the holotype of *A. maurula* is a male) are readily separable. *A. maurula* was published in December 1917; Strand's species is dated 1914, but owing to circumstances then prevailing, did not reach me until long after (see Ann. Mag. Nat. Hist., Aug. 1934, p. 251). It is impossible to be quite sure, without breeding records, that I have correctly identified the male of *A. pogonias*. Two males from De Beer's Ranch have the clypeal mark white, expanded below, the scape white in front and the basitarsi white. In general, they are like *A. maurula*, but they differ by the black mandibles, and the little lateral marks next to sides of clypeus. For the present, I place them as a variety of *A. pogonias*, but with misgivings.

Allodapula pulchripes, new species

FEMALE.—Length about 5 mm.; black, with the legs, except the coxae, bright chestnut red; scape broadly red in front; clypeal mark white, occupying the whole of upper half, but the lower half of the mark, though broad, cuneiform, narrowing to a blunt apex; tubercles white; tegulae hyaline; wings clear hyaline, with large nearly black stigma; nervures light brown. In some specimens the clypeal mark is yellowish. Labrum reddish; mandibles black; flagellum black; front shining; mesothorax highly polished; scutellum dull, but anteriorly shining seen from in front; recurrent nervures received equally distant from base and apex of second cubital cell; hair of hind legs slightly golden; hind margins of tergites narrowly reddish; first tergite with a pair of depressions near apical margin.

Southern Rhodesia: Matopo Hills, April 17–30 (L. Ogilvie, A. Mackie). Allied to *A. rufipes* Friese, but that has the scape white in front, and red mandibles, and comes from Kigonsera, near the north end of Lake Nyasa. Four specimens were taken.

A specimen from Lubumbashi, Katanga, July 22, 1920 (Michael

Bequaert), is provisionally referred here as a variety. The stigma is red, the scape shows less red, the scutellum is less shining, and the clypeal mark is light yellow, with the angle at the constriction almost a right angle. A second specimen, with the same data, agrees, except that the scape has even less red, only a basal spot. This insect is intermediate between *A. pulchripes* and *A. littoralis*, but probably constitutes a distinct race.

Allodapula pusilla, new species

FEMALE.—Length about 4 mm.; black, including labrum, mandibles and scape, flagellum brownish beneath; clypeal mark yellow, T-like, but with a very stout parallel-sided stem, and extremely short arms, the downwardly directed projections defined only by a brown line on each side; the upper margin is straight; mesothorax highly polished; scutellum shining but not polished; area of metathorax dull seen from above, a little shining seen from behind; tegulae brown, rather pale; wings strongly reddened; stigma dusky red with a dark margin; nervures brown; second cubital cell short, first recurrent nervure joining extreme basal corner, second a moderate distance from apex; abdomen shining throughout, hind margins of tergites reddened, tubercles of first tergite poorly developed.

Southern Rhodesia: type from Vumba, Umtali, May 23–26 (A. Mackie). Another from Christmas Pass, Umtali, May 20–21 (J. Ogilvie). For comparisons see *A. krugeri.*

Allodapula rhodesi, new species

FEMALE.—Length, 4 to 4.5 mm.; black, including labrum, mandibles and antennae, the flagellum obscurely brownish beneath; clypeal mark creamy white, T-like, but the stem is long, and the transverse arms are very short, squarely truncate, with no projecting points (a second specimen shows small points at lower corners); tubercles with a slender light margin; mesothorax polished, posteriorly dull; scutellum and area of metathorax dull; tegulae dark brown; wings dusky (not reddened), with a brilliant pink and green iridescence; stigma dark reddish, nervures brown; second cubital cell very long, receiving second recurrent nervure far from end, first recurrent meeting intercubitus; legs black, hind tibiae with much white hair; abdomen broad, shining throughout.

Southern Rhodesia: Matopo Hills, April, two (J. Ogilvie). For comparisons, see *A. krugeri.*

Allodapula rufipennis, new species

FEMALE.—Length about 7 mm.; black, including labrum, mandibles, antennae and tubercles; tegulae very dark brown, almost black; wings very strongly reddened; stigma reddish, with a heavy black margin; second cubital cell long, receiving first recurrent nervure near base, second more remote from apex; marginal cell on second cubital longer than on first; clypeus produced, with a yellow mark like that of *A. hamatifera* with a very long parallel-sided moderately thick stem, the transverse bar at upper end short, and produced to a hook-like form downward at each end; meso-

thorax highly polished; scutellum rather short, somewhat shining but not polished; area of metathorax dull; legs black, the tarsi slightly brownish apically; hair of sides of thorax and of legs dull white; first tergite deeply excavated, the sharply defined marginal region forming a shining band, which has in the middle a slight elevation, but there are no paired tubercles; sternites fringed with short white hair.

Belgian Congo (District du Kivu): Tshibinda, Aug. 24, 1931 (J. Ogilvie). It runs out at 26 in Friese's table, and it finds no place in that of Strand. It is actually very close to *A. hamatifera* Cockerell, but apparently a distinct species, on account of the red wings, the distinctly narrower head and thorax and the smaller, shining scutellum. A male which I can only refer to *A. rufipennis* was taken at Tshibinda by J. Ogilvie. It has a bright orange clypeal mark, deeply constricted in middle (with no little lateral marks), the upper part broadly goblet-shaped, straight above, convex at sides, the lower part large and extending right across clypeus; labrum with a large yellow spot; mandibles, antennae and tubercles entirely black; hind trochanters with two dentiform projections. The wings are strongly reddish, and the second cubital cell is extremely broad on marginal.

Allodapula rufitarsis, new species

MALE.—Length about 3.5 mm.; black, broad, shining, mesothorax highly polished, scutellum shining seen from in front; clypeus shining yellow, the light color with small lateral constrictions, next to which are small and short lateral marks; labrum yellow; mandibles black; scape black; frontal keel very strong; tubercles with a pale crescent; tegulae hyaline; wings clear hyaline; stigma light brown with dark margin; nervures brown; second cubital cell receiving first recurrent nervure rather far from base, second near apex; tarsi very pale reddish; abdomen very short and broad, subglobose.

Southern Rhodesia: Matopo Hills, April 17–30, 1932 (Alice Mackie). Distinguished from *A. melanosoma* Cockerell by the smaller size, white-margined tubercles and pale tarsi. The clypeus is not grooved, as it is said to be in *A. minuta* Friese. Two males from Blaukrans, near Calvinia (Cockerell), are referred here. One has the little lateral marks next to clypeus as in the type, but the other lacks them. In the former the basitarsi are creamy white, in the later very pale red. The flagellum has a hardly noticeable reddish or brownish tinge beneath. Another male from Blaukrans (J. Ogilvie) has the face-mark broader, and the little lateral marks are longer than in the type, going about halfway up the upper part of clypeal mark, from which they are separated by a very slender line.

The following key separates this species from several similar ones (males):

1.—Scutellum polished; wings perfectly clear; mandibles not spotted. *rufitarsis*, n. sp.
Scutellum not polished ..... 2.
2.—Legs red; mandibles not spotted ..... *matopina* Cockerell.
Legs not red ..... 3.
3.—Mandibles not spotted; face-mark white; tubercles black. *melanosoma* Cockerell.
Mandibles conspicuously spotted ..... 4.
4.—Wings reddish; stigma large and dark; hind basitarsi clear light yellow; small lateral marks rather remote from upper part of clypeal mark. *umtalica ornata* Cockerell.
Wings not at all reddish ..... 5.
5.—Clypeal mark broader, cream-color, with conspicuous small lateral marks opposite constriction; wings perfectly clear ..... *albomaculata* Cockerell.
Clypeal mark narrower, broad below, with no little marks opposite constriction; wings grayish ..... *maurula* Cockerell.

A male from National Park, Natal, March (L. Ogilvie) is provisionally referred to *A. rufitarsis* as a variety. The wings are not so clear, and there are no little marks by the lateral incisions of clypeal mark. Also, the mandibles are without spots. The scutellum is polished as seen from in front.

A female which I ascribe to *A. rufitarsis* is from Shangani, De Beer's Ranch, May (A. Mackie). It is about 4.5 mm. long (much smaller and less robust than *A. vernayi*) and is separated from various allied forms by the clypeal mark truncate (not rounded) above, the wings clear hyaline and the stigma pale, with a dark margin. The clypeal mark is white, T-like, with a long stem; tubercles with a pale spot; scutellum not polished. One from Biano, Katanga, August (J. Ogilvie) is provisionally referred here as a variety, but the clypeal mark is yellow and the transverse bar is thicker. It is probably a distinct species. These females have the tarsi black, rufescent only at tip.

Allodapula rufosticta, new species

FEMALE.—Length about 6.8 .; mm black, including labrum, mandibles and scape; flagellum faintly brownish beneath, but fourth antennal joint with a large red spot on under side; clypeal mark T-like, pale yellow, the upper (transverse) part thick, but hardly half length of stem, its upper margin slightly concave; stem thick, nearly parallel-sided, at upper end broader than the combined lateral extensions; mesothorax highly polished, the median sulcus distinct; scutellum highly polished all over; area of metathorax large, dull, with a shining margin; tubercles yellow; tegulae very dark brown; wings brownish hyaline; stigma large, dusky reddish, with a dark margin; nervures pale; second cubital cell receiving first recurrent nervure a short distance from base, the second more remote from apex; legs black, the tarsi rufescent apically; hair of hind legs pale reddish; abdomen broad, the first three tergites shining, hind margins of fourth and fifth narrowly brown; first tergite with a swelling on each side near hind margin.

Cape Province: Montagu Pass, Oct. 4, 1931 (L. Ogilvie). Nearest to *A. acutigera* Cockerell, which it resembles in the polished scutellum, though the clypeal mark is quite different. In *A. acutigera* the fourth antennal joint shows an excessively minute red spot beneath. By the various tables, it runs to a series of species, from which (females) it is separated thus:

1.—Scutellum dull or hardly shining.....2.
Scutellum evidently shining; tubercles marked with yellow.....3.
2.—Broad upper (transverse) part of clypeal mark a rather narrow band; tubercles black.....*nigricollis* Vachal.
Broad upper part of clypeal mark subquadrate, not greatly shorter than the stem; tubercles with a light mark.....*taita* Strand.
3.—Smaller; broad part of clypeal mark about as long as stem; flagellum with no red spot near base.....*maurula* Cockerell.
Larger; broad part of clypeal mark much shorter than stem; flagellum with a red spot near base.....*rufosticta* Cockerell.

Allodapula rugosella, new species

FEMALE.—Length about 4 mm.; shining black (the abdomen shining to apex); labrum rufous, but mandibles black; antennae black, flagellum thick; clypeus with a delicate median groove; clypeal mark a broad yellow band (reddened by cyanide in type), in middle about as broad as the black area on each side of it, its upper end for a short distance evidently but not greatly expanded, its upper margin straight; mesothorax finely roughened and with scattered minute punctures, not polished; scutellum finely punctured and dullish; tubercles with a yellow border; tegulae pale testaceous; wings dusky hyaline; stigma pale with a dark brown border; nervures pale; second cubital cell receiving recurrent nervures some distance (about equally distant) from base and apex; legs black, the tarsi obscurely rufescent apically; first tergite without distinct tubercles.

Belgian Congo: Kabalo, Aug. 15, 1931 (J. Ogilvie). By the clypeal band it resembles *A. gorillarum*, which is larger, with darkened stigma, and the form of the clypeal mark is really quite different. It is in many respects similar to *A. minuta* Friese, and it nearly agrees with *A. minutula* Friese from Kigonsera, though the broad abdomen (parallel-sided except at base and apex) is not cylindrical, and the segments do not have whitish bands. It evidently falls in the same group, of minute species with roughened (not polished) mesothorax.

A male from Tenke, July–Aug. (T. D. A. Cockerell) is referred to *A. rugosella* with confidence. It is about 4 mm. long and has the minutely sculptured mesothorax. The clypeus is yellow (reddened by cyanide), not very deeply constricted in middle, the upper margin slightly concave, the sides of upper part gently convex, the lower part as wide as upper, with a prominent shoulder on each side above, but there are no little

lateral marks. Labrum yellow; mandibles black; scape with a slender yellow stripe, tubercles with a bright yellow crescent. The tarsi are yellowish white. This comes near *A. albitarsis* Friese, from Eritrea.

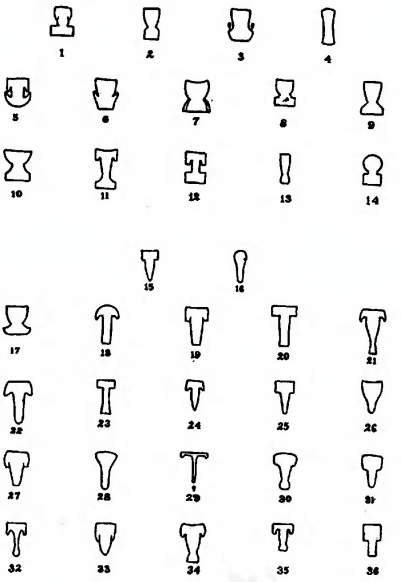
Allodapula umtalica, new species

MALE—Length about 5 mm.; black, with shining claviform abdomen, narrowed basally; mandibles, flagellum and tubercles black; labrum with a minute yellow spot at upper end; clypeal mark a very broad yellow band, broadly and shallowly constricted at sides, the upper edge straight, the sides of the upper part straight but gently sloping inward, the sides of the shorter lower part strongly rounded; no little lateral marks; scape with a pale stripe; thorax with quite abundant grayish-white hair; mesothorax polished, scutellum shining but not polished; area of metathorax large, dull with shining margin; mesopleura shining; tegulae small, dark brown; wings strongly brownish; stigma dark brown, nervures brown; second cubital cell very broad above, receiving first recurrent nervure at extreme basal corner, second some distance from apex; marginal tubercles on first tergite nearly obsolete; hind margins of tergites not pallid; legs black, with pale reddish tarsi, the hind basitarsi blackened at base.

Southern Rhodesia: Vumba, Umtali, May 23–26, 1932 (J. Ogilvie). The clypeal mark suggests *A. gorillarum,* from near Lake Kivu, but it is much broader than the black areas on each side of it, whereas in *A. gorillarum* it is at middle not broader than the black areas. *A. gorillarum* also has dark basitarsi.

There is a series of males from Umtali, most of which will run to *A. facialis* Gerstaecker in Friese's table, but they all differ from that in the dark brown tegulae and other characters. They may be separated thus:

1.—Mandibles with a large yellow spot; conspicuous short stripes laterad of the constrictions of facial mark; tubercles yellow; wings very brown; abdomen broad at base.....*umtalica ornata,* new variety.
Mandibles all black, or with small spot; lateral stripes of face absent or rudimentary.....2.
2.—Clypeal mark with the upper part heart-shaped, emarginate above; wings pale, slightly brownish; second recurrent nervure much more distant from end of second cubital cell than first from base; scape with a yellow stripe; tubercles with a yellow crescent.....*pogonias* Strand, variety.
Clypeal mark with the upper part narrower, not heart-shaped; wings browner..3.
3.—Tubercles all black; clypeal mark a broad band.....*umtalica* (typical form).
Tubercles marked with yellow.....4.
4.—Scape all black; mandibles with light spots.....5.
Scape with light markings.....6.
5.—Lower part of clypeal mark distinctly broader than upper....*umtalica,* variety *b.*
Lower part of clypeal mark not broader than upper.....*umtalica,* variety *c.*
6.—Mandibles with a minute light spot.....*umtalica,* variety *d.*
Mandibles not spotted.....*umtalica,* variety *e.*



Face-marks of males:

1.	*Allodapula luapulina*		8.	*Allodapula elizabethana*	
2.	"	*rugosella*	9.	"	*maurula*
3.	"	*ornata*	10.	"	*rufipennis*
4.	"	*umtalica*	11.	"	*angolensis*
5.	"	*melanosoma*	12.	"	*wilmattae*
6.	"	*albomaculata*	13.	"	*gorillarum*
7.	"	*flavolateralis*	14.	"	*lucidula*

Face-marks of females:

15.	*Allodapula antiquorum*		26.	*Allodapula innata*	
16.	"	*rugosella*	27.	"	*bukaviella*
17.	"	*matopina*	28.	"	*kivuensis*
18.	"	*convexa*	29.	"	*debilitata*
19.	"	*pusilla*	30.	"	*malleifera*
20.	"	*rhodesi*	31.	"	*maurula*
21.	"	*bulbifera*	32.	"	*rufipennis*
22.	"	*krugeri*	33.	"	*pulchripes*
23.	"	*fuscinervis*	34.	"	*diloloensis*
24.	"	*nigrinervis*	35.	"	*luckhoffi*
25.	"	*gracilis*	36.	"	*longula*

It is quite possible that *A. umtalica* is represented only by the type, all the varieties being referable to a distinct species, *A. ornata*. All have

dark brown tegulae; clypeus convex, shining, not at all grooved or hollowed; mesothorax polished, scutellum somewhat shining but not at all polished. The size is the same in all. In the types of *A. umtalica* and *ornata*, the first recurrent nervure joins the extreme basal corner of second cubital cell; in the others it is as far from base as the second from apex. In no case does it actually meet the intercubitus. The tarsi have the basitarsi cream-color (clear or dusky) and the small joints rufescent, suggestive of *A. rufitarsis*, which is easily separated by the perfectly clear wings. As regards the spot on mandibles, variety *c* has quite a distinct spot, somewhat triangular; but *b* has very minute spots, and *d* the same, on one side only. The variety *c*, looked at from the front, appears to have the scape all black, but on one side there is an imperfect pale stripe, visible in lateral view. It is thus evident that the characters given to distinguish *b*, *c*, *d*, and *e* do not even separate recognizable races or varieties. The *ornata* form appears to belong to the same series, being the extreme most remote from *umtalica*.

All the varieties are from Vumba, Umtali (J. Ogilvie, L. Ogilvie). So also the *A. pogonias* variety. I have not found a female for *A. umtalica*, but suspect that it is represented among the numerous specimens which I have not felt able to separate from *A. pogonias*. A male from Uvira, Belgian Congo, Aug. 28–29 (J. Ogilvie) is referred to *A. umtalica ornata*, though the upper part of clypeal mark is wider and the first recurrent nervure is much more distant from base of second cubital cell. The wings are reddened and the scape has a yellow stripe in front. Another from Uvira (J. Ogilvie) was separated because the little lateral marks are punctiform, nearly obsolete. It is evidently the same species, but the Uvira insect may have to be separated from *A. umtalica ornata* when better known.

Allodapula usambaricola (Strand)

Tanganyika Territory: Dar-es-Salaam, four females, June 9 (J. Ogilvie); Tanga, two females, June 10 (J. Ogilvie, L. Ogilvie).

Sudan: Port Sudan, one female, June 26 (J. Ogilvie).

The stigma is large and well developed.

Allodapula wilmattae (Cockerell)

Belgian Congo: Tenke, one male (Alice Mackie).

Southern Rhodesia: Males from Battery Spruit, near Umtali (J. Ogilvie), and Christmas Pass, Umtali (J. Ogilvie). The tongue and labial palpi in this species are very long.

LOCALITY.—Arizona: Scottsdale, Britcher coll., Dec. 30, 1902, two adult males (one of which is designated the holotype), one adult female (allotype), and four immature females.

LIODRASSUS, NEW GENUS

In general structure close to *Herpyllus* from which most readily distinguished in lacking teeth on the margins of the furrow of the chelicerae, the lower margin being wholly smooth and the upper margin, at most, bearing a low chitinous keel not broken into distinct teeth. Posterior median eyes less than their diameter apart. Anterior median eyes decidedly larger than the laterals. Tibiae III and IV with no median dorsal spines. In male palpus the femur with a conspicuous angular prominence on the ectoventral side; cymbium excavated on exterior side for reception of tibial apophysis.

GENOTYPE.—*L. arizonicus*, new species.

Liodrassus arizonicus, new species

Figures 4, 5, and 6

MALE.—Carapace and sternum pale chestnut. Carapace clothed as usual with rather sparse, dark long setae which are longer in the eye region, and finer appressed, plumose white hair. Sternum clothed with dark setae which are longer about the borders. Legs more yellowish. Abdomen gray with a light chestnut scutellum at base above; clothed with coarser erect or suberect setae and fine, plumose, appressed white hair.

Tarsi and metatarsi of legs I and II scopulate beneath, the scopulae of metatarsi the more sparse. Tarsi and metatarsi III and IV not scopulate. Tibia I with a single ventral spine at distal end; metatarsus I with a pair of stout ventral spines at proximal end. Tibia II with ventral spines 0–1–1 to 0–2–2; metatarsus II with a pair of spines at proximal end. Tibiae III and IV with no median dorsal spines.

Anterior row of eyes procurved, with the laterals their diameter or a little more from the margin of the clypeus; medians decidedly larger than the laterals (diameters approximately as 4:3), two-thirds their radius apart, and almost contiguous with the laterals. Posterior row of eyes nearly straight. Median eyes smaller than the laterals (ad 9:10), somewhat oblique, two-thirds their diameter apart, rather less than their radius form the laterals; lateral eyes about their radius from the anterior laterals. Area of median eyes as wide anteriorly as long, wider anteriorly than behind (ad 26:23). Palpus as shown in the figures.

FEMALE.—Coloration and spining of legs as in the male. Posterior row of eyes gently procurved. Disproportion in eyes of anterior row rather less than in the male. Epigynum as shown in the figure.

Male.—Total length, 7.00 mm. Length of cephalothorax, 3.20 mm.; width, 2.00 mm.

Legs:	I	II	III	IV
Coxa-trochanter.....	1.30 mm.	1.17 mm.	1.08 mm.	1.30 mm.
Femur.....	1.90 "	1.80 "	1.73 "	2.17 "
Tibia-patella.....	2.43 "	2.39 "	2.17 "	2.60 "
Metatarsus.....	1.17 "	1.17 "	1.30 "	1.90 "
Tarsus.....	0.86 "	0.70 "	0.78 "	0.86 "
TOTAL	7.66 mm.	7.23 mm.	7.06 mm.	8.83 mm.